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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,485

04/15/2005

Junji Yumoto

14321.69

8722

22913 7590 03/05/2007

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EXAMINER

NIU, XINNING

ART UNIT

PAPER NUMBER

2828

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

03/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/531,485	YUMOTO ET AL.	
	Examiner	Art Unit	
	Xinning(Tom) Niu	2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 37-76 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-76 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/17/2005, 01/13/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 10/17/2005 and 01/13/2006 was filed after the mailing date of the instant application on 04/15/2005. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:
4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 37-41, 43, 44 are rejected under 35 U.S.C. 102(e) as being by anticipated Furukawa et al. (U.S. 2004/0027648).

6. Regarding claim 37, Furukawa et al. discloses a first and second laser generating laser beams of different wavelengths, a nonlinear optical crystal that generates a sum frequency from the light of the two lasers. The sum frequency satisfies the relationship of  $\frac{1}{\lambda_1} + \frac{1}{\lambda_2} = \frac{1}{\lambda_3}$  and wherein the wavelength of the sum is 589.3 nm ([0035], [0036], [0043], Figure 1).

7. Regarding claim 38, Furukawa discloses the nonlinear crystal has a periodic structure that satisfies  $\frac{2\pi n_3}{\lambda_3} = \frac{2\pi n_1}{\lambda_1} + \frac{2\pi n_2}{\lambda_2} + \frac{2\pi n_2}{\Lambda}$  ([0053], [0054]).

8. Regarding claims 39-41, 43, 44, 45 Furukawa teaches a nonlinear optical crystal having a waveguide structure ([0046]), a first laser and second laser emitting at the desired wavelength range and the two laser being DFB lasers ([0043], [0044]).

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2828

10. Claims 42, 49, 50, 51, 52, 56, 57, 58, 59, 63, 64, 65, 66, 70, 71, 72, 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. (U.S. 2004/0027648).

11. Regarding claim 42, Furukawa et al. discloses a first laser with oscillation wavelength 980nm-1080nm and a second laser with oscillation wavelength 1300nm - 1400nm. Furukawa et al. do not disclose first wavelength of 940nm and second wavelength of 1565nm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Regarding claim 49, Furukawa et al. discloses the limitations of claim 37 with a first laser with oscillation wavelength 980nm-1080nm and a second laser with oscillation wavelength 1300nm - 1400nm. Furukawa et al. do not disclose the wavelength range of the first and second laser as defined in the claim. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Art Unit: 2828

13. Regarding claim 50, please see the rejection for claim 38. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

*In re Aller*, 105 USPQ 233.

14. Regarding claim 52, please see the rejection for claim 43. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

*In re Aller*, 105 USPQ 233.

15. Regarding claim 56, please see the rejection for claim 49.

16. Regarding claim 57, please see the rejection for claim 50.

17. Regarding claim 58, please see the rejection for claim 51.

18. Regarding claim 59, please see the rejection for claim 52.

19. Regarding claim 63, please see the rejection for claim 49.

20. Regarding claim 64, please see the rejection for claim 50.

21. Regarding claim 65, please see the rejection for claim 51.

22. Regarding claim 66, please see the rejection for claim 52.

Art Unit: 2828

23. Regarding claim 70, please see the rejection for claim 49.

24. Regarding claim 71, please see the rejection for claim 50.

25. Regarding claim 72, please see the rejection for claim 51.

26. Regarding claim 73, please see the rejection for claim 52.

27. Claims 46, 47, 53, 54, 60, 61, 67, 68, 74, 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. (U.S. 2004/0027648) in view of Corsini et al. (U.S. Patent 5,796,764).

28. Regarding claim 46, Furukawa et al. teaches the limitations of claim 37 but does not teach a polarization maintaining fiber and a multiplexer. However, Corsini et al. teaches a pump laser coupled polarization maintaining fiber (23) and a multiplexer (41) (Figure 1, Col 6-8). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical waveguide apparatus as taught by Furukawa et al. with multiplexer and polarization maintaining fiber as taught by Corsini et al. in order to maintain the polarization of the light waves and also to combine or separate different wavelengths from multiple input signals.

29. Regarding claim 47, Furukawa et al. teaches that the first and second lasers are semiconductor lasers. Furukawa et al. do not teach polarization maintaining fibers having a fiber Bragg grating. However, Corsini et al. teaches polarization maintaining fibers with Bragg gratings (Col 7).

Art Unit: 2828

30. Regarding claim 53, please see the rejection for claim 46. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

31. Regarding claim 54, please see the rejection for claim 47. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

32. Regarding claim 60, please see the rejection for claim 53.

33. Regarding claim 61, please see the rejection for claim 54.

34. Regarding claim 67, please see the rejection for claim 53.

35. Regarding claim 68, please see the rejection for claim 54.

36. Regarding claim 74, please see the rejection for claim 53.

37. Regarding claim 75, please see the rejection for claim 54.

38.



39. Claims 48, 55, 62, 69, 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. (U.S. 2004/0027648) in view of Corsini et al. (U.S. Patent 5,796,764) and Hattori et al. (U.S. Patent 5,012,478)

40. Regarding claim 48, the combination of Furukawa et al. and Corsini et al. discloses the limitations of claim 47. The two references do not disclose a laser that has a front facet reflectance of 2% or less and a rear facet reflectance of 90% or more. However, Hattori et al. disclose a laser with front facet reflection of 2% and a rear facet reflection of 90% (Col 2). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify optical waveguide apparatus as taught by Furukawa et al. and Corsini et al. with the semiconductor laser as taught by Hattori et al. in order to concentrate the power in the output beam for high power operation.

41. Regarding claim 55, please see the rejection for claim 48. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the range of the emission wavelength of the lasers, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

42. Regarding claim 62, please see the rejection for claim 55.

43. Regarding claim 69, please see the rejection for claim 55.

44. Regarding claim 76, please see the rejection for claim 55.

***Conclusion***

45. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ishino (U.S. Publication 2003/0123498 discloses coupling light from a first and second laser source using an optical waveguide. Yamamoto et al. (U.S. Patent 6,738,397) discloses a first and second laser device and a phase matching device combining the two laser beams and outputting a terahertz beam.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xinning(Tom) Niu whose telephone number is 571-270-1437. The examiner can normally be reached on M-T, 7:30-5:00 EST, Alternate Fridays 7:30-4:00 ES.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Sun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2828

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Xinning Niu  
02/21/2007



**MINSUN OH HARVEY**  
**PRIMARY EXAMINER**